TTμL9016

HEX INVERTER

TRANSISTOR-TRANSISTOR MICROLOGIC® INTEGRATED CIRCUITS

A FAIRCHILD COMPATIBLE CUURRENT SINKING LOGIC PRODUCT

GENERAL DESCRIPTION

The 9016 consists of six TTμL gates where each gate performs a single inversion function. Designed for high speed operation, the 9016 is very useful where a number of complement signals are desired simultaneously.

FEATURES

- High Speed Operation
- Input Diode Clamping
- High Capacitive Drive Capability
- The input/output characteristics provide easy interfacing with Fairchild DTμL, LPDTμL, TTμL and MSI families (CCSL.)
- All ceramic "HERMETIC" packages

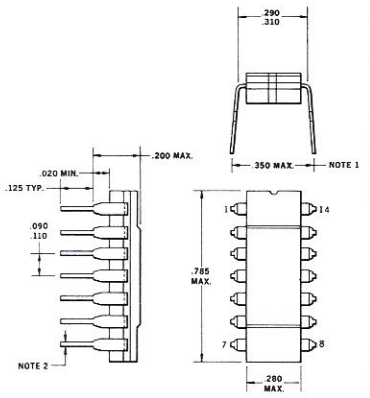
ABSOLUTE MAXIMUM RATINGS (above which the useful life may be impaired)

Storage Temperature	-65°C to +150°C
Temperature (Ambient) Under Bias	-55°C to +125°C
V_{CC} Pin Potential to Ground Pin	-0.5V to +8V
Input Voltage	-0.5V to +5.5V
Voltage Applied to Outputs	-0.5V to +V_{CC} value

ORDER INFORMATION

Specify U3I90165XX for flat package and U6A90165XX for Dual-In-Line package, where 5XX is 51X for -55°C to +125°C temperature range or 59X for the 0°C to +75°C temperature range.

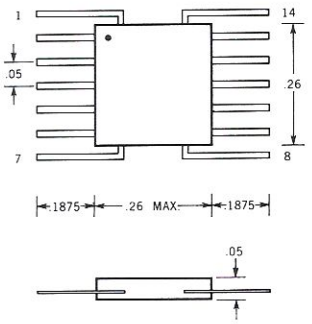
TYPICAL DUAL IN-LINE PACKAGE



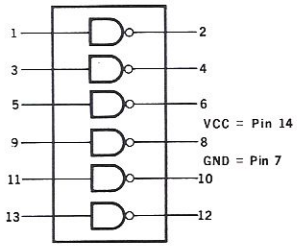
NOTES:
1. Leads are intended for insertion in hole rows on .300" centers. They are purposely shipped with "positive" (.350) misalignment to facilitate insertion.
2. Board drilling dimensions should equal your practice for a conventional .020 inch diameter lead.

TYPICAL FLAT PACKAGE

TOP VIEW



LOGIC DIAGRAM



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TRANSISTOR-TRANSISTOR MICROLOGIC® I. C.

ELECTRICAL CHARACTERISTICS 0°C to +75°C, Vcc=5.0V ±5%

SYMBOL	CHARACTERISTICS	LIMITS 0°C MIN.	0°C MAX.	+25°C MIN.	+25°C TYP.	+25°C MAX.	+75°C MIN.	+75°C MAX.	UNITS	CONDITIONS & COMMENTS
V_{OH}	Output High Voltage	2.4		2.4	3.0		2.4		Volts	V_{CC} = 4.75V, I_{OH} = -1.2 mA V_{IL} = VALUE INDICATED BELOW
V_{OL}	Output Low Voltage		0.45		0.2	0.45		0.45	Volts	V_{CC} = 4.75V, I_{OL} = 14.1 mA V_{CC} = 5.25V, I_{OL} = 16.0 mA
V_{IH}	Input High Voltage	1.9		1.8			1.6		Volts	Guaranteed input high threshold for all inputs.
V_{IL}	Input Low Voltage		0.85			0.85		0.85	Volts	* Guaranteed input low threshold for all inputs.
I_F	Input Load Current		-1.6		-1.0	-1.6		-1.6	mA	V_{CC} = 5.25V, V_F = 0.45V
I_F	Input Load Current		-1.24		-0.97	-1.24		-1.24	mA	V_{CC} = 4.75V V_F = 0.45V
I_R	Input Leakage Current				15	60		60	μA	V_{CC} = 5.25V, V_R = 4.5V
t_{pd+}	Turn Off Delay			3	8	15			ns	V_{CC} = 5.0V C_L = 15pF
t_{pd-}	Turn On Delay			3	7	13			ns	

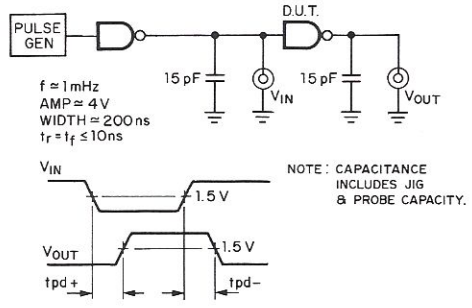
* Pulse Tested (pulse duration = 50 msec.)

ELECTRICAL CHARACTERISTICS −55°C to +125°C, Vcc=5.0V ±10%

SYMBOL	CHARACTERISTICS	LIMITS 0°C MIN.	0°C MAX.	+25°C MIN.	+25°C TYP.	+25°C MAX.	+75°C MIN.	+75°C MAX.	UNITS	CONDITIONS & COMMENTS
V_{OH}	Output High Voltage	2.4		2.4	2.7		2.4		Volts	V_{CC} = 4.5V, I_{OH} = -1.32mA V_{IL} = VALUE INDICATED BELOW
V_{OL}	Output Low Voltage		0.4		0.2	0.4		0.4	Volts	V_{CC} = 4.5V, I_{OL} = 13.6mA V_{CC} = 5.5V, I_{OL} = 17.6mA
V_{IH}	Input High Voltage	2.0		1.7			1.4		Volts	Guaranteed input high threshold for all inputs.
V_{IL}	Input Low Voltage		0.8			0.9		0.8	Volts	*Guaranteed input low threshold for all inputs.
I_F	Input Load Current		-1.6		-1.10	-1.6		-1.6	mA	V_{CC} = 5.5V V_F = 0.4V
I_F	Input Load Current		-1.24		-0.97	-1.24		-1.24	mA	V_{CC} = 4.5V V_F = 0.4V
I_R	Input Leakage Current				15	60		60	μA	V_{CC} = 5.5V, V_R = 4.5V
t_{pd+}	Turn Off Delay			3	8	12			ns	V_{CC} = 5.0V C_L = 15pF
t_{pd-}	Turn On Delay			3	7	10			ns	

* Pulse Tested (pulse duration = 50 msec.)

tpd TEST CIRCUIT



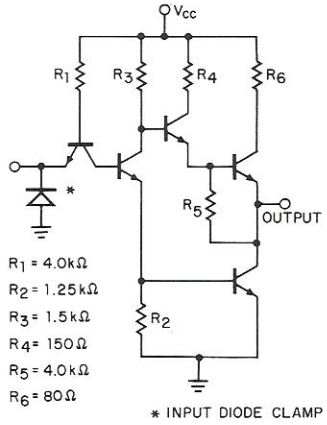
LOADING RULES

INPUT LEVEL	LOAD FACTOR
HIGH	1
LOW	1

OUTPUT STATE	FANOUT 51X	FANOUT 59X
HIGH	22	20
LOW	11	10

1 HIGH LEVEL LOAD = I_R
1 LOW LEVEL LOAD = I_F

SCHEMATIC DIAGRAM



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WHAT IS IT?

The 9016 is another CCSL Hex Inverter. It consists of six TTμL gates. See Figure 1. Each gate performs a single inversion operation. Because of its characteristic high speed, this device is very useful where a number of complement signals are required simultaneously.

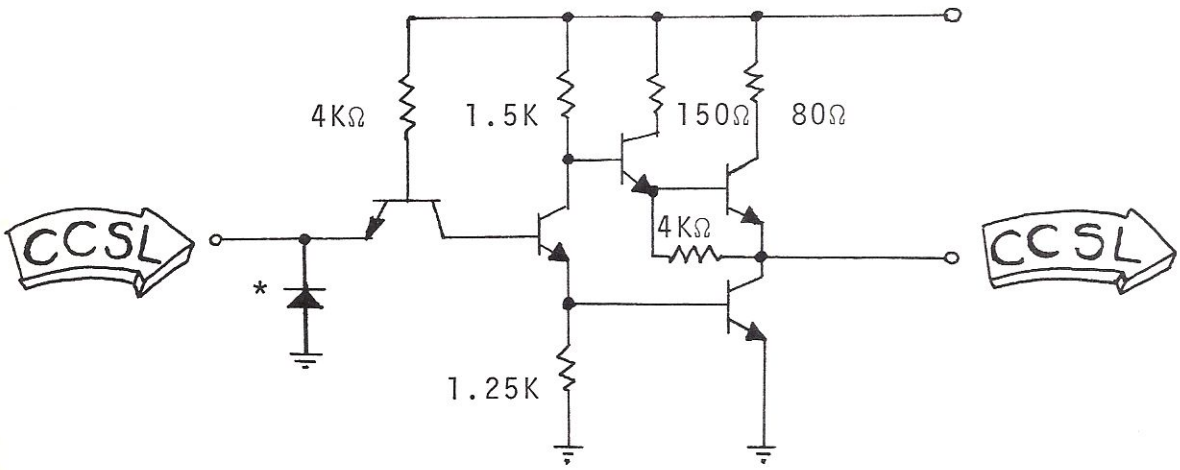


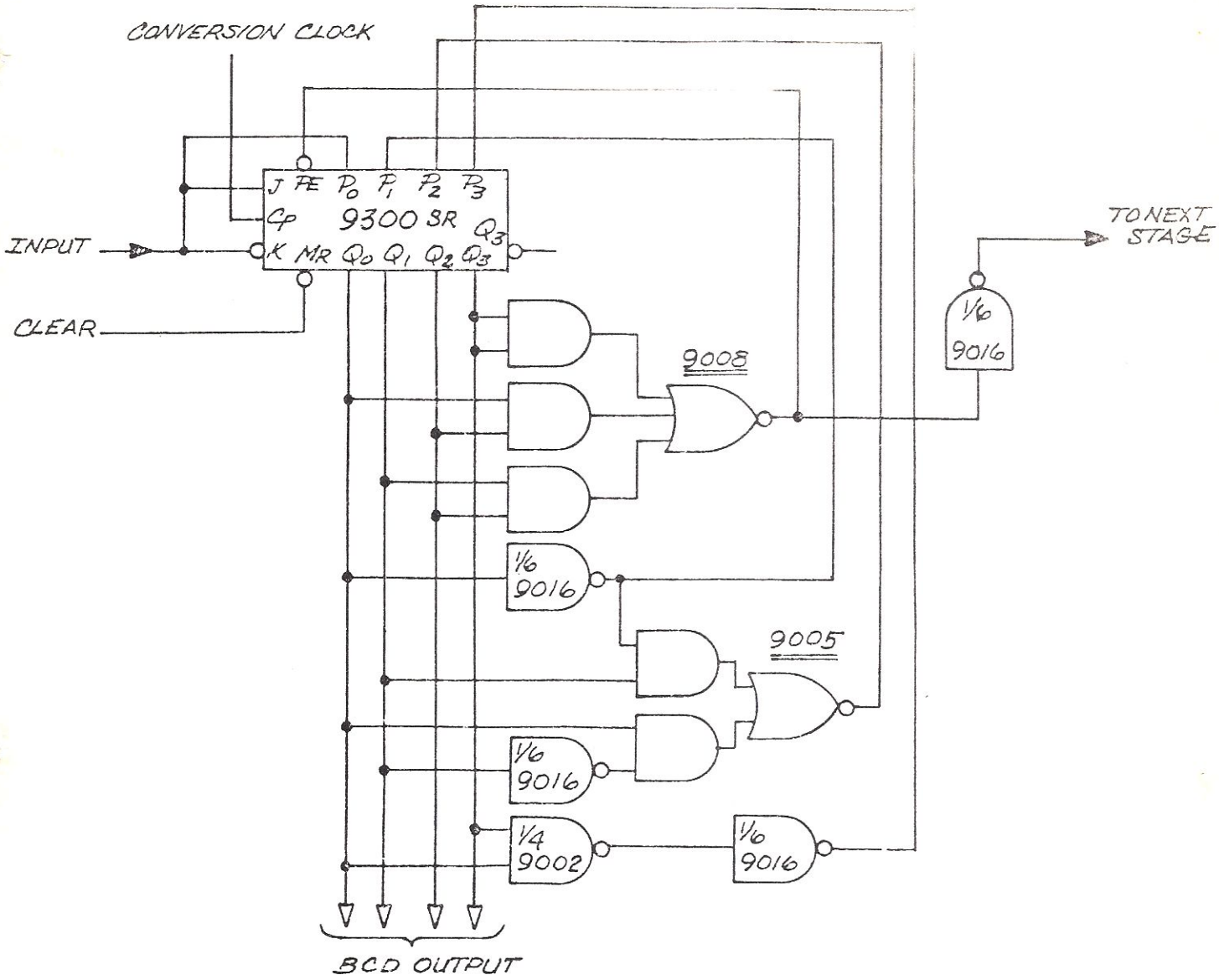
FIGURE 1

The input circuitry features our unique *INPUT DIODE CLAMPING!

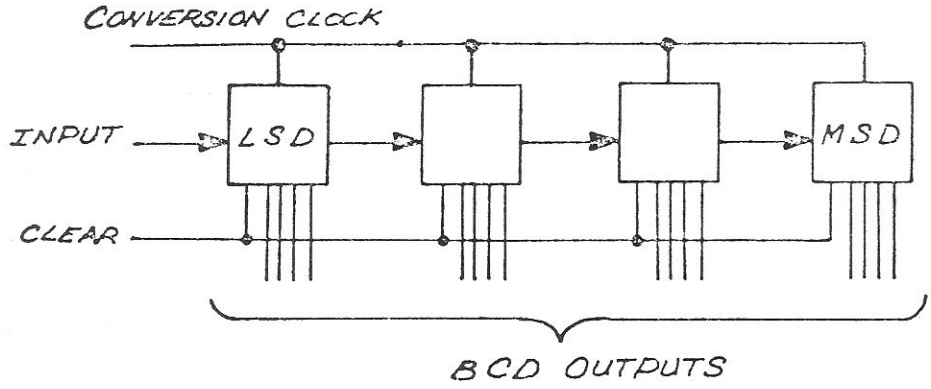
While in the output is our superior TTμL "totem-pole" circuit which provides higher speeds and higher output drive capability!

The TTμL 9016 is mechanically and logically identical to the DTμL 9936 Hex Inverter element, except that the 9016 gate has lower propagation delay (typically 8 ns).

* FAIRCHILD is the first in the industry to provide "input diode clamps" on all TTμL circuits!



FOUR STAGE CONVERTER



4 - 9300
4 - 9008
2 - 9005
1 - 9002
3 - 9016
14 Elements Total

APP. 0-13 Binary-To-BCD Converter Rev. (b)

A binary number shifted, most significant bit first, into a number of stages large enough to hold the results, will be converted to BCD after the clock shifts the last bit into the converter.